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U. S. DEPARTMENT OF
AGRICULTURE

FARMERS' BULLETIN No. 960 ^{rev.}
_{Febr. 1927}

NEUFCHÂTEL
AND CREAM CHEESE

- - FARM - -
MANUFACTURE
AND USE

Rev. ed.
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NEUFCHÂTEL CHEESE is named after the town of that name in northwestern France. Cream cheese is usually made from milk having about 6 per cent fat, while Neufchâtel is made from ordinary 4 per cent milk. Cream cheese is also marketed in a number of combinations or flavorings, a popular form containing pimiento peppers.

This group of soft cheeses can be made with little trouble and at small expense for equipment. Although now largely produced in factories, they can be manufactured at home for family use. Frequently also the surplus milk of a small dealer can be marketed advantageously as Neufchâtel, cream, or pimiento-cream cheese.

While these varieties of soft cheese are highly regarded, their real food value is often unappreciated. When served alone or in any one of a multitude of dishes they are palatable and appetizing as well as nourishing.

NEUFCHÂTEL AND CREAM CHEESE: FARM MANUFACTURE AND USE

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CHARACTERISTICS OF THE NEUFCHÂTEL GROUP OF CHEESES

CHEESES of the Neufchâtel group have been produced in the United States almost exclusively by a very few factories whose methods were not readily available to the public and whose extensive and high-priced equipment created the mistaken notion that it is not practicable to make these cheeses except upon a factory scale. The methods of manufacture of Neufchâtel and cream cheese and their modifications are, however, simple, and the equipment needed for making them in small quantities is not elaborate; therefore an excellent opportunity is offered to produce at low cost a fresh, wholesome, and attractive food for home use. Since Neufchâtel and cream cheese may be marketed upon a small scale, they often offer to dairymen an exceptional opportunity for the disposal of surplus milk.

The cheeses of this group are perishable, and their selling prices are somewhat higher, pound for pound, than the harder cheeses. They are coming more and more into common use, however, because, in addition to their rich flavor and high nutritive value, they may be used with other foods to form many appetizing dishes. When cheeses of this group are to be sent to market, special, though inexpensive, equipment is necessary in order to obtain the greatest efficiency of time and labor in molding them into marketable form. An expenditure of from \$10 to \$25 will provide proper equipment for handling

¹ Mr. Cammack resigned June 30, 1920.

NOTE.—The first 20 pages contain material prepared by the Bureau of Dairy Industry; the following pages by the Bureau of Home Economics.

the cheese from several hundred pounds of milk. Such equipment should enable the dairyman to make and market cheese directly to the consumer at less cost and in fresher condition than that shipped from a more distant point. The fact that fresh cheese can be obtained readily will tend to increase its consumption.

THE MANUFACTURE OF NEUFCHÂTEL AND CREAM CHEESE

In this bulletin the production of the Neufchâtel group of cheeses is considered from two points of view, (1) for home consumption and (2) for marketing on a small scale.

QUALITY OF MILK

The quality of milk is the first consideration in the production of good Neufchâtel or cream cheese. Milk which is sour or has undergone any abnormal fermentation should not be used. By the use of fresh, unripened milk without any perceptible change in the acidity, the normal fermentations which are necessary for cheese of high quality can be controlled. Milk for cheesemaking should not be allowed to absorb any odors or taints, and the garlic flavor, especially, should be guarded against.

CLEAN UTENSILS

Cleanliness of utensils is another essential in producing cheese of high quality. The following system is advised in washing milk and cheese utensils:

1. After using, rinse with cold water.
2. Wash with hot water to which a washing powder has been added. Always use a brush.
3. Rinse in hot water at a temperature above 150° F.
4. Steam or immerse in boiling water for five minutes.
5. Do not dry the utensils with a cloth, but place them in a clean place free from dust.

RIPENING THE MILK

The cheese is made by allowing the acid and rennet, or other curdling agent, to act simultaneously upon the milk. If great care has been used in the production and subsequent handling of the milk, the cheese may be made by adding rennet and allowing the milk to sour normally. A rather rapid development of acid is most desirable, as this tends to eliminate undesirable flavors, hastens the making process, and prevents losses of the curd. The lack of uniformity in ripening often requires a more definite means of controlling the acid fermentation, which may be accomplished by the use of a "starter."

THE USE OF STARTERS

A "starter" is a quantity of milk that has soured and which contains large numbers of acid-forming bacteria. If the cheese is made in small quantities for home consumption, a starter is probably not advisable. The advantages of a starter over the natural souring are:

1. It hastens the coagulation of the milk.
2. It suppresses undesirable fermentations that may cause excessive losses of fat and curd.
3. It aids in suppressing undesirable flavors and produces more uniform cheese.

A starter of *Bacillus bulgaricus* may be used instead of the ordinary lactic-acid starter, but it is recommended only when there is a special demand for it.

STANDARDIZING THE MILK

In making cream cheese for the market, milk testing about 6 per cent butterfat is most satisfactory. With 4 per cent milk available, if one-third of the quantity is run through a cream separator and the cream added to the remaining two-thirds, milk testing approximately 6 per cent is obtained. If the milk tests only 3 per cent it will be necessary to separate one-half of the quantity and add the cream to the remaining half. This method gives satisfactory results for home manufacture, but for more extensive operations it is advisable to use a Babcock tester in order to standardize the milk accurately.

The following diagram illustrates an easy method of determining the proportions of milk and cream of different per cent of fat needed to make up 6 per cent milk:

<p><i>Cream and milk on hand.</i> 34 per cent cream.</p>	<p>6 per cent milk desired.</p>	<p><i>Proportions to be used.</i> 2 parts cream.</p>
<p>4 per cent milk.</p>		<p>28 parts milk.</p>

The desired per cent of fat in the milk, in this case 6, is placed in the center of the square. At the upper left-hand corner the per cent of fat in the available cream is placed, in this instance 34. Immediately below, in the lower left-hand corner, the per cent of fat in the available milk is placed, which in the instance cited is 4. Next subtract diagonally across the square the smaller from the larger numbers and place the differences in the upper and lower right-hand corners respectively. In the upper right-hand corner 2 represents the number of parts of 34 per cent cream, and in the lower right-hand corner 28 represents the number of parts of 4 per cent milk necessary to make 6 per cent milk. If it is desired to make up a definite quantity of 6 per cent milk, for example, 60 pounds, the procedure is as follows: 2 added to 28 makes a total of 30 parts of 6 per cent milk. The quantity of 34 per cent cream necessary is $\frac{2}{30} \times 60$, or 4 pounds, while the quantity of 4 per cent milk is $\frac{28}{30} \times 60$, or 56 pounds.

PASTEURIZATION

It is not always practicable to pasteurize the milk to make cheese for home use, but if the cheese is to be marketed it is very desirable to do so. When milk is pasteurized for cheesemaking it becomes absolutely essential to use a "starter" to obtain uniform results. It is advisable, also, to use the milk as soon as possible after pasteurization. Ordinarily, pasteurization is accomplished by heating the milk in a pail, can, or vat to a temperature of 145° F., and holding at that

temperature for 30 minutes, after which it should be quickly cooled to 78° F. before adding the starter for ripening. The advantages of pasteurization are as follows:

1. It destroys disease-producing organisms.
2. It tends to reduce losses and increase the yield.
3. It aids in eliminating undesirable flavors.
4. Quality of cheese is more nearly uniform from day to day.

MAKING THE CHEESE

The process described is identical for Neufchâtel and cream cheese, except for a few minor differences which will be mentioned.

Setting.—Unless otherwise noted, 30 pounds, or about 3½ gallons of milk, is the unit used in these directions; that quantity can be handled conveniently in a shotgun can. For smaller quantities any enameled or heavily tinned pail is satisfactory.

If a starter is added, it is advisable to use a quantity equal to ¼ to ½ per cent of the milk; while smaller quantities may be used, the proportions suggested are usually the most satisfactory.

Neufchâtel is made from ordinary milk, while the cream cheese requires milk containing about 6 per cent of butterfat. Milk for Neufchâtel is warmed to 78° F., and one-half pint of starter is added and thoroughly stirred in with a long-handled spoon or milk agitator. Then 8 or 10 drops of commercial liquid rennet, diluted in half a cupful of cold water, is added to the mixture, thoroughly stirred, and the can of milk set away to coagulate at 78° F. Powdered pepsin, which is cheaper than rennet, may be used instead, in which case a quantity equal to one-half of a medium-sized pea, dissolved in a cupful of cold water, is used. Fresh junket tablets also may be substituted for rennet. One tablet is dissolved in 10 tablespoonfuls of cold water and 3 tablespoonfuls of the solution used. For cream cheese a slightly larger quantity of the curdling agent is desirable.

For cream cheese the milk is warmed to 80° F., the process being the same in other respects. When starter is not used in making either kind of cheese, the process is unchanged except that after thoroughly stirring the milk it is set away, at the temperature described, for several hours before the rennet or other curdling agent is added.

After the milk has been set away to coagulate it should be kept as nearly as possible at the same temperature. Under normal conditions, after about 15 or 18 hours, about one-half inch of whey collects upon the surface of the curd or coagulum; on the top of the whey a scum of fine white curd particles sometimes collects. This formation of whey indicates a normal fermentation. When the fermentation is abnormal, the coagulum is more or less convex, puffed, or inflated, and there is little, if any, whey on the surface.

A gassy fermentation of the curd does not necessarily render a cheese unfit for consumption; but for best results, both as to flavor and economy in handling, that condition should be prevented. Under ideal conditions the milk usually begins to coagulate in the course of a few hours, but is allowed to stand undisturbed for from 15 to 18 hours. It is advisable to set it so that the curdling occurs during the night, and if the cans are not provided with covers they should be covered with a close-meshed cheesecloth in order to exclude dirt.

Draining.—After the setting period, when whey has collected upon the surface of the coagulum, or when the milk is firmly clabbered, the contents of the can or pail are poured upon a strong drain cloth. (See fig. 1.) The can may be shaken slightly before pouring, in order to loosen any curd which has a tendency to adhere to the sides or bottom. Unbleached cotton sheeting, which can be obtained in yard widths, has proved to be the most satisfactory material for drain cloths. For a small-scale operation the cloth may be thrown over a pail, can, or wash boiler and the ends tied securely about the draining receptacle. The curd or coagulum should remain undisturbed in the cloth for 3 or 4 hours, after which it should be worked toward the center of the cloth in order to hasten the draining and get it in better condition for handling. Drainage is allowed to continue until most of the visible whey has escaped and the curd appears rather dry as compared with its former mushy condition. Then the four corners of the cloth should be drawn diagonally across and tied. For home consumption, and especially when it is not cooled, the curd should be allowed to drain for a longer time before pressing.

Cooling the curd.—While the cooling of the curd is very desirable, it is not absolutely necessary. The object of cooling is to

facilitate the more rapid expulsion of whey during pressing. Cooling also seems to harden the curd so that it does not pass so readily into the meshes of the drain cloth and thereby interfere with and retard the expulsion of the whey. The bags of curd are placed on ice, or cracked ice is placed about them and left for a few hours.

Pressing.—After cooling, several bags of the curd are piled together between two boards and a weight of 50 pounds placed on top. (See fig. 2.) Frequent rearrangement of the bags will hasten the process. After this weight has been left on the cheese overnight, the curd should be in flat cakes. For Neufchâtel it is preferable



FIG. 1.—Pouring the curd into the drain cloth

to press the curd from 30 pounds of milk until the pressed curd weighs $4\frac{1}{2}$ pounds, while for cream cheese it should weigh about $5\frac{1}{2}$ pounds. Special care should be taken in determining the yield of cheese in order to obtain a uniform quality from day to day, which can be done by weighing the curd. The manner and length of time of pressing determines, in a large measure, the texture of the cheese. By using a screw press the curd may become too dry and gummy,

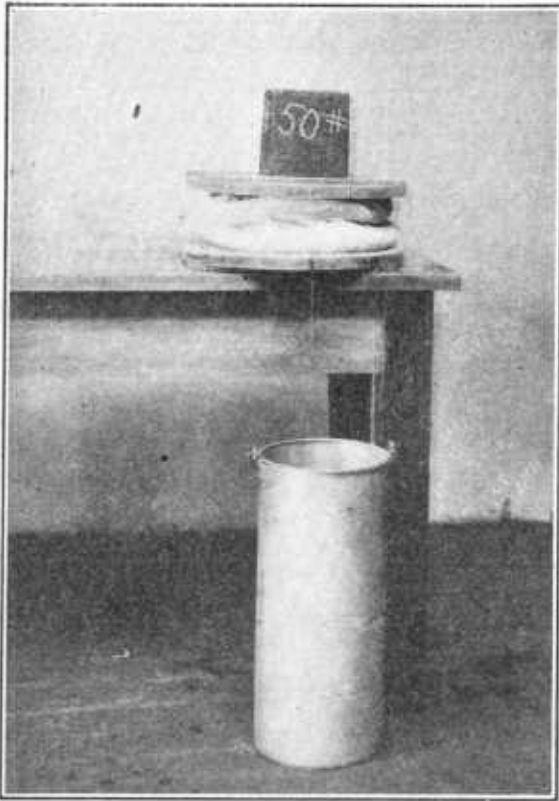


FIG. 2.—An improvised cheese press

but under ordinary conditions there is little danger if improvised equipment is used. (See fig. 3.)

Working and salting.—After having been properly pressed the cakes of curd are salted and worked with a potato masher or butterworker, or run through a food chopper to produce a smooth, buttery consistence.

Fine, dry salt is sprinkled over the curd at the rate of about 2 or $2\frac{1}{2}$ ounces to 10 pounds of curd, or about two level tablespoons to the curd from 30 pounds of milk. (See fig. 4.) The quantity of salt may be varied to suit the individual taste; the quantities recommended, however, usually give the best

satisfaction. If the curd is worked with a potato masher the addition of salt aids in obtaining the proper smoothness of the cheese.

When cheese is made for home consumption it may be placed in a glazed crock or porcelain dish immediately after salting and held at a temperature as near 50° F. as possible until consumed. Under favorable conditions it will keep in good condition for from 6 to 12 days. When cheese is kept a few days at a temperature of 60° to 70° F., it will become disagreeably sour. It is most palatable immediately after it is made, for then it is fresh, soft, and sweet. When very cold, or after having been kept for some time, it does not have so fine a flavor.

Combinations with Neufchâtel and cream cheeses.—Finely chopped pimiento peppers may be mixed with either Neufchâtel or cream cheese at the time of salting. Such cheese has a mild though pro-

nounced flavor and is very popular for sandwiches and salads. The pimientos seem to have a certain preservative effect and tend to cover up "off flavors" that may develop. About 1 pound of the chopped pimientos is added to 12 pounds of cheese, or about one-half pound for the cheese from 30 pounds of milk.

While there are numerous other cream-cheese combinations, there are two that are worthy of especial note—olive-pimiento cream and Roquefort cream cheese. Both of these flavoring ingredients should be added at the rate of 1 part to 10 parts of cream cheese. When Roquefort cheese is uniformly incorporated with cream cheese it gives to the combination a rich and pleasing flavor very similar to Roquefort cheese, though milder.

Molding.—Cheese for home consumption need not be molded. When marketed a special device is necessary in order to shape the cheese into a commercial package. Neufchâtel, cream, and pimiento cheeses require a special style of package. While there are numerous devices for molding, many of them are not suited for meeting market demands. As a result of considerable experimenting, the attachments described below were devised to fit the ordinary food chopper and proved to be very satisfactory for handling the several kinds of cheese.

For molding small quantities of cheese the following equipment is desirable (see figs. 8 to 12):

1. A food chopper.
2. A hopper.
3. Two molding attachments for chopper.
4. A cheese conveyer.
5. A cheese cutter.

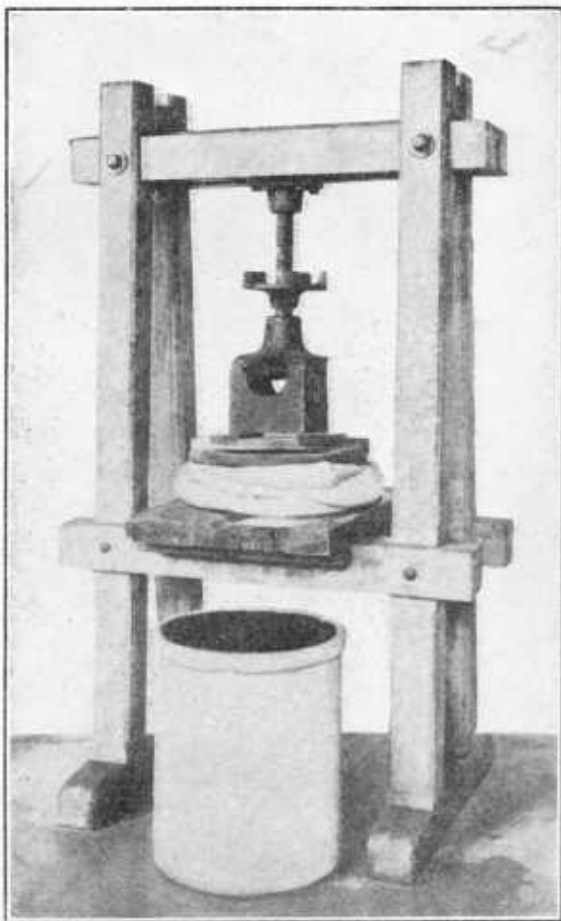


FIG. 3.—A screw press

When used for molding, both the knives and the plate should be removed from the chopper; otherwise the cheese will go through with great difficulty. The cheese hopper is a boxlike arrangement clamped to the top of the food chopper to prevent the scattering of particles

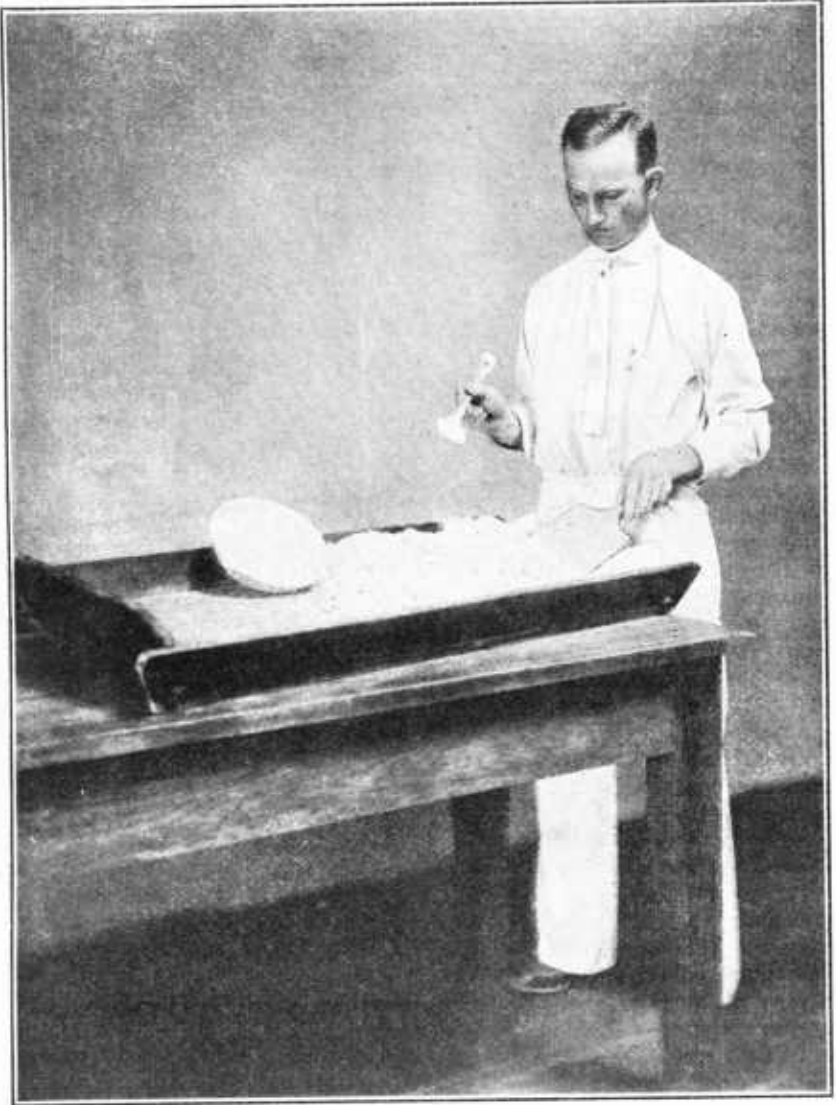


FIG. 4.—Salting and working the cheese

of cheese upon the worktable. The cheese is poured into the hopper at short intervals, since it is not advisable to keep the hopper more than half full, or the feed screw will not force the cheese so readily through the hopper. If the hopper is full the cheese may become too "gummy" and will not only be difficult to force through the

chopper, but will adhere to the long-handled spoon used to push the lumps of curd into the machine. It is advisable to use a spoon in order to keep one corner of the hopper free of the cheese and, by allowing the escape of air, facilitate the grinding of the cheese.

The lips of the molding attachment are fastened to the chopper by means of a ring. The attachment for molding Neufchâtel cheese is cylindrical and is about $1\frac{1}{2}$ inches in diameter at its delivery end. The cheese, forced through this attachment, comes out in the form of a roll or cylinder.

Pimiento cheese is forced into a special glass jar smaller than a jelly glass or a paraffined wood-fiber container held horizontally over



FIG. 5.—Filling jars with pimiento-cream cheese

the end of the Neufchâtel attachment so that the cheese reaches the end of the container and flattens out without difficulty. (See fig. 5.) If the pimiento cheese is to be used in a short time, the wood-fiber containers are especially recommended, as they are less expensive than glass jars. If the cheese is marketed directly to the consumer, the glass jars may be returned and used again.

The attachment for cream cheese is rectangular at its delivery end. By its use the cheese may be molded into smooth, ribbonlike bands which, as in the case of Neufchâtel cheese, may be cut with a wire into pieces of the desired size.

The cheese is delivered from the attachment on a canvas conveyer, supported by rollers, which turn with sufficient friction to cause the

plastic curd to be firmly pressed together as the cheese is automatically pushed forward. (See fig. 6.) The first cheese that passes through the attachment often "frills"; that is, it presents an irregular surface, but later the difficulty becomes less marked, and the cheese comes out with a surface well defined and smooth. "Frilling" occurs more often in molding cream cheese than in Neufchâtel.

Cutting the cheese.—Cream cheese and Neufchâtel cheese may be cut into cakes of the desired size by means of fine wires drawn over a rectangular-shaped framework. (See fig. 11.) The use of this simple equipment makes it possible to cut half a dozen cheeses simultaneously and prevents delay, so that one person may do the grinding while another cuts and wraps the cakes.

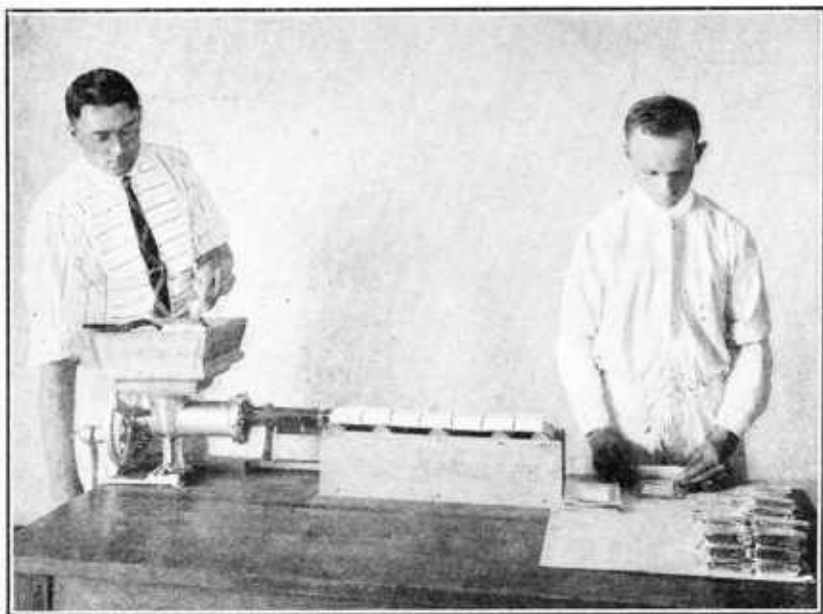


FIG. 6.—Molding and wrapping cream cheese

Wrapping the cheese.—After cutting the cakes they are slowly carried along by the carrier and eventually fall upon a flat form upon which tin-foil wrapping papers are laid. These papers may be held in place by a cleat or clamp. In many cases it is more convenient to take the cheese directly from the carrier, but when the person who does the wrapping is kept very busy the platform may serve as a place where several cakes may accumulate, thus allowing the grinding operations to be continued. While one person is engaged in filling the hopper and molding the cheese another is kept busy cutting and wrapping. In wrapping, the cheese is placed in the center of the paper, each side of the paper folded over, and the ends turned down, to cover the cheese completely. (See fig. 10.)

Yield.—One hundred pounds of milk containing 4 per cent fat should yield from 14 to 16 pounds of Neufchâtel cheese, while 6 per cent milk should give an average yield of from 17 to 19 pounds

of cream cheese. With milk testing less than the above, a smaller yield and a lower grade of cheese will be obtained. Although there may be slight seasonal fluctuations in the solids of milk, yet for the most part the yield of cheese, other conditions being equal, is almost directly proportional to the per cent of fat. There may be variations in yield of cheese, however, due to mechanical factors, such as longer pressing.

Neufchâtel cheese is sometimes made from skim milk, in which case it is used for cooking and baking purposes. Commercially, there are other grades of Neufchâtel made from one-half or two-thirds skim milk. Such cheeses are labeled as made from "partially skimmed milk" or "skimmed milk" as the case may be.

Packages.—Tin-foil or aluminum-foil wrapping paper which has a parchment paper inside is generally used in wrapping cream and Neufchâtel cheeses, since it gives each package a bright, uniform,

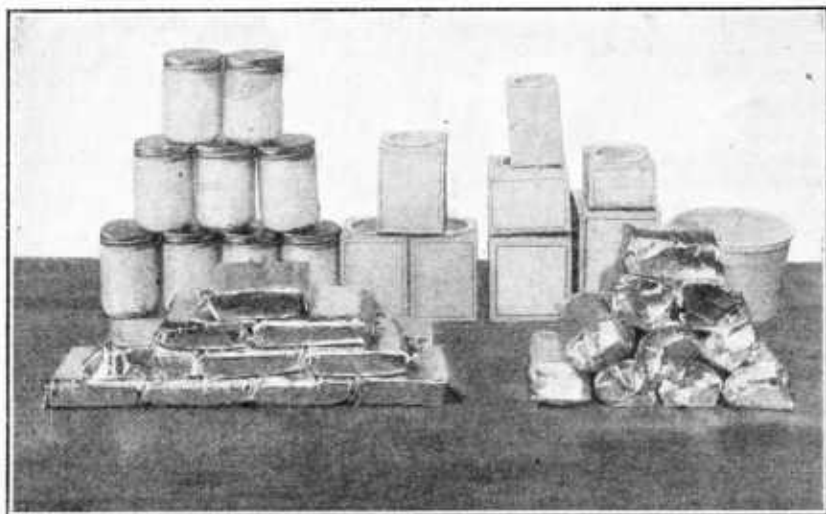


FIG. 7.—Types of packages

and attractive appearance. (See fig. 7.) Great care should be taken to wrap each cake neatly and securely in order to exclude the air as much as possible. Any "frilling" or other irregularities may be corrected by drawing the foil tightly about the cheese. Careful and skillful wrapping tends to increase the length of time the cheese is salable. The yellow or amber-colored mold which often spreads over the cheese should be prevented as much as possible, not because it may render the food harmful or poisonous, but because it causes deterioration and renders the cheese less appetizing.

The standard Neufchâtel package is cylindrical, about $1\frac{1}{2}$ inches in diameter by $2\frac{1}{2}$ inches long, and weighs about $2\frac{1}{2}$ ounces net. Standard packages of cream cheese are about 3 by 2 inches and 1 inch thick, and have a net weight of about 3 ounces. The pimiento cheese is marketed in 3 or 4 ounce glass jars, each packed full and covered with a disk of paraffined paper and screw cap.

COST OF MANUFACTURE

When made upon a small scale the cost of the various items of making these kinds of cheese for market purposes is difficult to ascertain. The cost of manufacturing them on a farm scale would probably be quite different from the cost of manufacturing them on a factory scale. The figures given are based upon the use of 200 pounds of 4 per cent milk, valued at \$2.40 a hundredweight, which is made into cheese twice weekly with equipment costing about \$25. The cost of the equipment depends, of course, upon that already available and that which may readily be improvised. Under average conditions the approximate cost of the various items of expense involved in making the three kinds of cheese is enumerated as follows:

COST OF MAKING CREAM CHEESE

With 200 pounds of 4 per cent milk a dairyman should be able to make 24 pounds of cream cheese, and with the skim milk 12 pounds of cottage cheese in addition. At present cream cheese is marketed in 3-ounce packages. Figuring conservatively, the yield from 200 pounds of milk, then, would be about 120 packages of cream cheese and 12 pounds of cottage cheese. Assigning a value of 6 cents a pound for the latter, and subtracting the amount received for it, the cost of the milk used for cream cheese would be reduced from \$4.80 to \$4.08. The cost of milk for each package of cream cheese, then, would be \$0.034.

The cost of special equipment necessary for handling the cheese may be proportioned as follows:

1 food chopper.....	\$8.50
6 shotgun cans.....	5.10
6 drain racks.....	4.50
2 molding attachments.....	2.00
1 carrier.....	1.25
1 thermometer.....	.60
1 hopper.....	.50
1 cheese cutter.....	.50
6 yards of cloth for draining.....	.75
1 pail.....	.85
1 agitator or stirrer.....	.25
2 spoons, long-handled.....	.20

25.00

A good food chopper should last 10 years, a drain rack 5 years, and a shotgun can about 3 years. Figuring a yearly depreciation of about 20 per cent, the depreciation charges would be \$5. The interest at 6 per cent on the investment would be \$1.50, and the interest and depreciation charges per cheese, if 12,000 a year are made, would be $1/12000$ of \$6.50, or \$0.00054.

The labor would require half an hour to pasteurize the milk, about $1\frac{1}{2}$ hours to make the cheese, and another half hour to mold it, or about $2\frac{1}{2}$ hours, actual time for the various operations. However, while in pressing it would require but a few minutes to handle the cheese, the entire pressing operations would extend over several hours. It is assumed, therefore, that the time not used in working with the cheese could be utilized in some other manner. The total labor charge

would be 50 cents, figuring labor at 20 cents an hour. The labor charges would then be $1/120 \times 50$, or \$0.00416 for each cheese.

Figuring the cost of pasteurization and separation as 1 cent a gallon, the charge for each cheese would be \$0.00192. It would require about 50 pounds of ice for the 24 pounds of cheese, which would make the ice cost about \$0.00016. Figuring the rennet at \$10 a gallon and the salt at 1 cent a pound, the charge would be \$0.00005, and \$0.004 for tin foil at 90 cents a pound:

Milk	\$0. 03400
Interest and depreciation .....	. 00054
Labor .....	. 00416
Pasteurization and separation .....	. 00192
Ice .....	. 00016
Salt and rennet .....	. 00005
Tin-foil wrapping paper .....	. 00400
Per cheese .....	. 04483

COST OF MAKING PIMIENTO-CREAM CHEESE

Pimiento-cream cheese is the same as cream cheese, with the single exception that pimiento peppers are added. Pimiento cheese is sometimes made from Neufchâtel instead of cream-cheese curd. The figures given here are based on the use of cream-cheese curd. The cheese is usually marketed in 4-ounce glass jars, which may be obtained in gross lots for about 2 cents each. Pimiento peppers cost about 40 cents a pound and are added to the cheese at the rate of 1 pound to from 10 to 20 pounds of curd, as some people prefer a higher proportion of the peppers. The figures given are on the basis of 1 pound of peppers to 12 pounds of cheese. The labor charge will be somewhat greater for pimiento cheese than for cream cheese; the labor charges are figured at $3\frac{1}{2}$ hours instead of $2\frac{1}{2}$, as in the case of cream cheese. There would then be a yield of 26 pounds of cheese, costing \$4.08. When pimiento cheese is produced under the conditions outlined the cost for each jar may be estimated as follows:

Milk	\$0. 03457
Interest and depreciation .....	. 00055
Labor .....	. 00593
Pasteurization and separation .....	. 00196
Ice .....	. 00016
Salt and rennet .....	. 00005
Glass jar .....	. 02000
Peppers .....	. 00666
Per jar .....	. 06988

COST OF MAKING NEUFCHÂTEL CHEESE

Figuring a yield of 15 pounds of cheese per 100 pounds of milk and each package weighing $2\frac{1}{2}$ ounces, the cost of making one Neufchâtel cheese may be estimated as follows:

Milk	\$0. 02500
Depreciation and interest .....	. 00033
Ice .....	. 00013
Labor .....	. 00260
Pasteurization .....	. 00120
Salt and rennet .....	. 00005
Tin-foil wrapping paper .....	. 00400
Per cheese .....	. 03331

MARKETING

Neufchâtel, cream, and pimiento-cream cheeses are sold by the box. The wholesale price of a cheese is usually 2 or 3 cents less than the retail price. Cream cheese retails for about 15 cents a package, Neufchâtel for 8 cents, and pimiento cream at 20 cents a jar.

RETURNS FROM 100 POUNDS OF MILK

Upon the basis of the calculated cost of manufacturing and at current prices for the cheese, the following returns should be obtained per 100 pounds of 4 per cent milk, viz, for cream cheese \$9, for Neufchâtel \$7.68, and for pimiento cream \$10.40. After subtracting the estimated cost of making the cheese from 4 per cent milk, valued at \$2.40 a hundredweight, there should be a net profit of \$6.30 for cream cheese, \$4.48 for Neufchâtel, and \$6.76 for pimiento cream. Rent and cost of marketing are not considered

POSSIBILITIES

The desirability of making these varieties of cheese upon a small scale and successfully marketing them depends upon the skill of the maker and his ability to obtain a direct and ready market for his product. When cheese is made and delivered once or twice a week, a dairyman is in far better position to serve the public by selling a perfectly fresh product than the larger manufacturers, working at a distance, who are obliged to dispose of their cheese several days after it is made, and who must pay the additional expense of boxing and shipping. If the cheese is marketed directly upon a small scale it is not necessary to put it into the flat boxes, as is the case if it is handled commercially. The cheeses may be disposed of satisfactorily by placing them in one large box and piling one cheese upon another. When cheese of this type is delivered upon a milk route the use of a special box provided with two compartments, one for ice and the other for cheese, is advisable during the warm periods of the year. Pimiento-cream cheese, because of its keeping quality, is particularly adaptable to small-scale operations. When sold in glass jars it is sold as readily as the product of the larger manufacturers. With a direct outlet, arrangements may be made to use the jars again and thereby reduce the cost of marketing.

When suitably situated it should be practicable for many dairymen to supply cheese to a neighboring town at good prices for their milk and extra trouble. It should be especially feasible for the milk dealer to dispose of his surplus milk in the form of cheese; in fact, in some cases for some of these kinds of soft cheese he would receive as much as or more than for the milk. By beginning in a small way the milk dealer should be able to develop a trade in fancy cheeses, such as cottage, Neufchâtel, cream, and pimiento cream, and by selling direct to the consumer he could compete successfully with larger manufacturers.

KEEPING QUALITIES OF THE CHEESE

When wrapped in foil and put into a cold place immediately after making, cream and Neufchâtel cheeses should keep from 6 to 12

days without developing objectionable flavors; usually cream cheese seems to keep somewhat better than Neufchâtel. If pimiento-cream cheese is placed in the customary jars and held at 50° F. or below, it should be still palatable at the end of a month. These products develop a sourish taste rather quickly when held at a high temperature. The temperature, therefore, is by far the most important factor concerned in regulating the keeping qualities of the cheese. There may be considerable variation in both the salt and water content of the cheese without causing much deterioration.

EQUIPMENT FOR MAKING NEUFCHÂTEL AND CREAM CHEESES

Little equipment is needed for making these cheeses for home consumption, and many satisfactory substitutes may be found for that mentioned. When the cheese is marketed on a large scale a greater outlay is desirable in order to handle it efficiently.

Floating dairy thermometer.—The use of a reliable and accurate thermometer is imperative if uniform results are to be obtained. A thermometer of this kind is not expensive, and when not in use should always be kept in the case.

Starter bottles.—Pint milk bottles, which may be covered with glass tumblers, are needed for holding the starter, although the size of the containers depends, of course, upon the quantity of cheese made. Pint fruit jars also can be used, and may be covered with bowls.

Shotgun cans.—These cans are usually 9 inches in diameter, 20 inches high, and hold about 4 gallons of milk. For work on a small scale a 10-quart, heavily tinned or enameled pail may be used satisfactorily.

Rennet and pepsin.—Commercial liquid rennet and powdered pepsin have been found to be satisfactory curdling agents. Fresh junket tablets also produce good results.

Milk agitator.—A stirrer is desirable to cause a uniform distribution of rennet or starter and to aid in preventing a too rapid rising of the cream. A long-handled spoon may be used if only a small quantity of cheese is made.

Draining rack.—The rack shown in Figure 1 is rectangular, 13 inches wide, 36 inches long, and 10 inches deep. The corner posts extend 1½ inches beyond the strips at top and bottom, with the top rounded, so that a ring may fit over them. The bottom slats fit loosely into notches and are removable for washing purposes. The materials required are 4 corner posts 1½ by 1½ by 10 inches, 9 strips 1 by ¾ by 36 inches, and 6 strips 1 by ¾ by 12¼ inches, notched to receive bottom slats, all made of pine. A cloth is fastened upon each frame and the contents of one can poured upon each cloth. For small-scale operations an orange crate or a boiler or pail may serve the same purpose.

Drain cloth.—Unbleached cotton sheeting is recommended for this purpose. A fine-meshed cloth gives strength and aids in preventing losses of fat and casein. The size of the cloth depends upon the nature of the draining rack. Each cloth should be 45 inches long

and a yard wide, with the ends hemmed. After use each should be quickly and carefully washed and dried in order to increase the period of its usefulness.

Press.—If a screw press is available, its use is to be recommended. A 50 or 60 pound weight, such as a can of water or bucket of stones, left upon the curd overnight usually proves to be satisfactory. (See figs. 2 and 3.)

Curd worker.—For small-scale operations a bread mixer or a potato masher may be used to give the curd proper consistence and to incorporate the salt. When working on a larger scale a butter-worker or food chopper will serve the same purpose.

Food chopper.—A food chopper with special attachments and a hopper are essential for molding the cheese into the desired forms. Depending upon the quantity of cheese handled, satisfactory food choppers may be obtained in three sizes, costing about \$2, \$5, and \$8.50. (See fig. 8.) The smaller machines may be used in handling

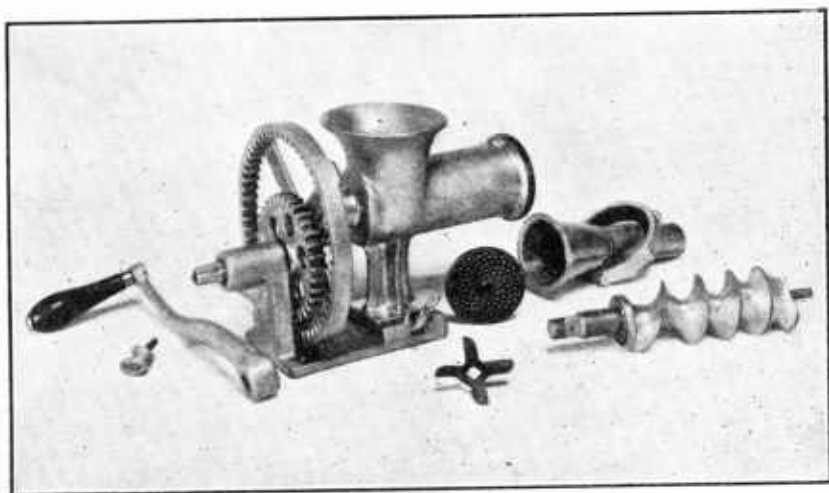


FIG. 8.—Grinding and molding equipment

Neufchâtel and pimiento-cream cheeses, but cream cheese requires the large size for making the customary flat packages. The large machine is to be recommended if the weekly output of cheese amounts to a few hundred pounds, although the medium-sized machine would probably do the work as effectively, only more slowly and with more labor.

Cheese hopper.—The hopper consists of an open box 3 inches deep, made of maple, with sides sloping outward about half an inch. The box has a hole in the bottom $3\frac{1}{8}$ by $3\frac{5}{8}$ inches. To the bottom of the box a board five-eighths of an inch thick is screwed, which has a hole corresponding to that of the box. The hopper is fastened to the food chopper by means of a beveled strip of wood and button, as indicated in Figure 9. The base of the box will probably have to be grooved in order to allow the wheel to turn without friction. The materials required are (1) two quadrangular-shaped pieces of wood 3 inches high, five-eighths of an inch in thickness, and whose tops meas-

ure $9\frac{3}{8}$ inches and the bottoms 8 inches; (2) two pieces of similar shape, except that the tops measure $11\frac{1}{2}$ inches and the bases $10\frac{1}{4}$ inches; (3) one piece $10\frac{7}{8}$ inches long, $10\frac{1}{8}$ inches wide, and three-quarters of an inch thick; (4) one piece $9\frac{3}{8}$ inches long, 7 inches wide, and three-quarters of an inch thick; and (5) one piece 7 inches long, $4\frac{3}{8}$ inches wide, and five-eighths of an inch thick.

Neufchâtel attachment.—The attachment for molding Neufchâtel and pimiento-cream cheeses consists of a tin form having a conical shape with a tube attached. The cone has a $2\frac{1}{4}$ -inch base which gradually tapers down to a tube whose diameter is $1\frac{1}{2}$ inches. (See fig. 10.) The distance from the base of the cone to the tube attached is $3\frac{1}{4}$ inches; the tube is about 5 inches long. A vertical lip about one-quarter of an inch across makes it possible to connect the tube to the food chopper; the attachment fits into the ring of the chopper.

Cream-cheese attachment.—The cream-cheese attachment consists of a ring to which a rectangular-shaped molding tube is soldered. (See fig. 10.) The base of this tube is $2\frac{1}{8}$ inches wide and fifteen-sixteenths of an inch thick. The delivery end of the tube, which is $2\frac{1}{8}$ inches wide and three-quarters of an inch thick, is cut back one-third of an inch at each corner and V-shaped pieces of tin removed. The lips of the tube are then drawn together until there is about one-sixteenth of an inch of free space at each corner.

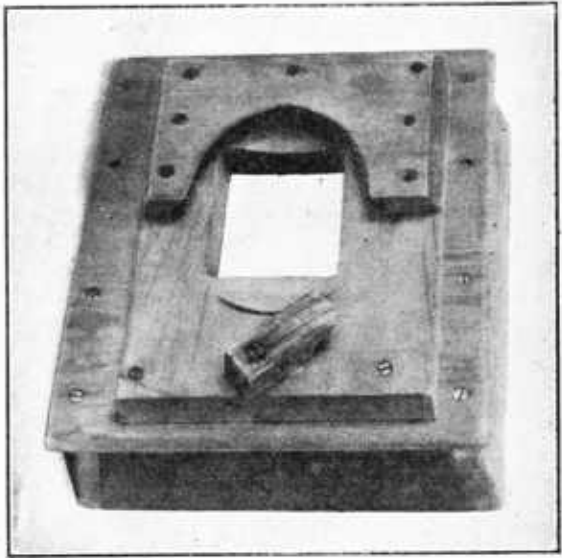


FIG. 9.—Under view of cheese hopper, showing method of attachment

Belt conveyer.—The belt conveyer used in removing the cheese as it leaves the attachment is shown in Figure 11. It is a rectangular-shaped box, 20 inches long, 6 inches wide, and $4\frac{3}{4}$ inches deep, with the ends and top removed. Five bearings fit into the notches on one side and holes on the other side in two strips of iron fastened to the upper edges of the two open ends of the box. A $3\frac{1}{2}$ -inch canvas belt runs snugly though not tightly upon the rollers. The materials required are two pieces of maple $4\frac{3}{4}$ inches wide, one-half inch thick and 20 inches long; four oak rollers $4\frac{3}{8}$ inches long and $1\frac{3}{4}$ inches in diameter; one oak roller $4\frac{3}{8}$ inches long and $1\frac{1}{2}$ inches in diameter. The rollers have a one-sixteenth-inch clearance and are beveled one-eighth of an inch from bearing to outer face. In addition, two 20-inch strips of galvanized iron 1 inch wide and one-eighth of an inch thick are needed. In both ends of one of these strips of iron there

are four outward-slanting notches which are one-half inch deep and one-eighth inch wide, and evenly spaced between the ends there are three additional vertical notches of the same size. There are 11 one-eighth-inch holes in the second iron strip, corresponding to, parallel with, and of the same height as the bottom of the notches of the first strip. The boards and strips of iron are joined together by means of screws.

Cheese cutter.—A cheese cutter consists of a rectangular framework of poplar over which 7 fine wires are drawn. (See fig. 12.) The wires are fastened by means of iron pegs or screws to the outer edge of two half-inch strips 15 inches long. The strips are 5 inches apart, parallel, and are supported by 3 vertical pieces of wood 5 inches long, 3 inches wide, and one-half inch thick. Each of these supports is hollowed out in order to give plenty of space for cutting the cheese. The vertical supports are held in place by means of a

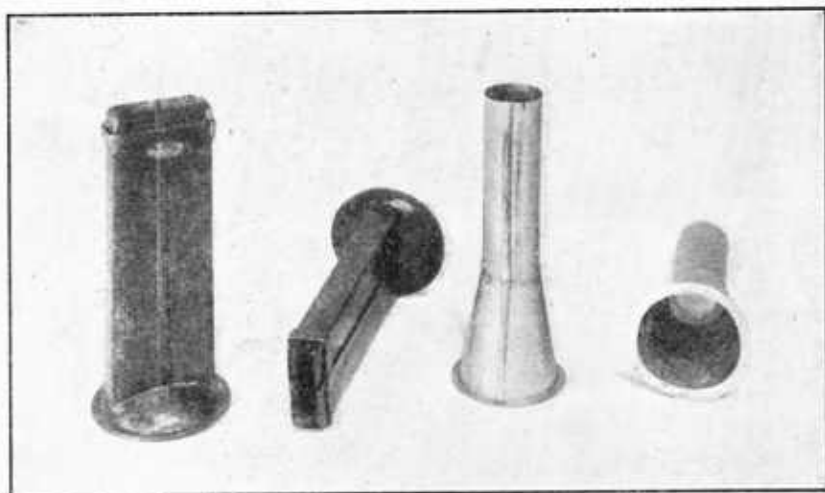


FIG. 10.—Molding attachments for Neufchâtel and cream cheese

single flat strip $13\frac{3}{4}$ inches long, seven-eighths inch wide, and one-quarter inch thick. The wires are placed $2\frac{1}{2}$ inches apart and the supports $6\frac{3}{4}$ inches apart. All connections are made with 1-inch screws.

Tin-foil paper.—Tin foil covered with parchment paper is generally used to wrap the cheese (cream or Neufchâtel), although of late aluminum foil has been used quite extensively. The dimensions of the foil are $4\frac{1}{2}$ by 6 inches, and it is purchased by the pound.

SUMMARY OF DIRECTIONS

The following outline for making the Neufchâtel group of cheeses is based on 30 pounds or $3\frac{1}{2}$ gallons of milk.

Except as noted, the process is the same for Neufchâtel as for cream cheese. For Neufchâtel cheese use whole milk that tests 4 per cent, and for cream cheese use milk standardized to 6 or 7 per cent.

If it is desired to pasteurize, heat the milk to 145° F., hold at that temperature for 30 minutes, then cool to 78° F. for Neufchâtel and 80° F. for cream cheese. If the milk is pasteurized, a starter must be added.

Add one-fourth of a pint of good starter or clean-flavored sour milk and stir well. Rennet is then added, approximately one-third of a cubic centimeter (about 8 drops), diluted in a cup of cold water, stirred in thoroughly, and the milk set aside to curdle. In place of rennet, powdered pepsin (one-half the size of a pea) dissolved in a cup of cold water, or one-third of a junket tablet dissolved in a like quantity of water, may be used. In making cream cheese it is advisable to use a very slightly larger quantity of the curdling agent than for Neufchâtel.

If the milk is not pasteurized, warm or cool it to the temperature mentioned above, add starter and rennet as described, and set away to curdle.

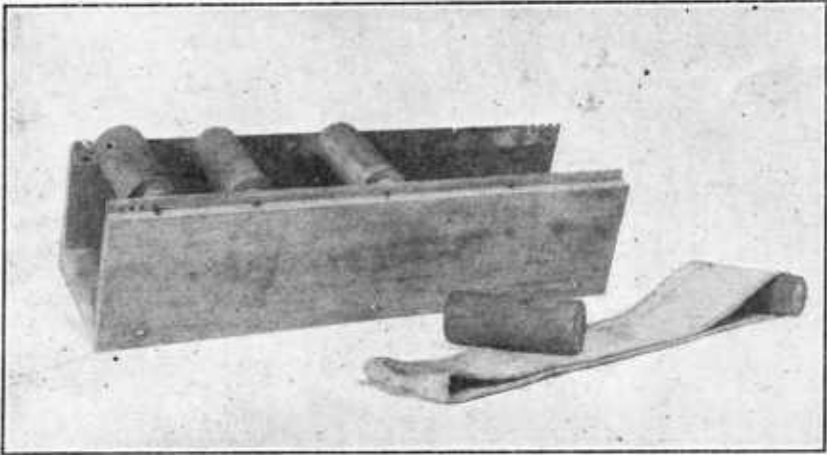


FIG. 11.—Belt conveyor

If starter is not used, the milk is set away for several hours, at the temperature described, before the rennet or other curdling agent is added. After thoroughly stirring, the milk is set away at the same temperature to curdle. In either process the time necessary for proper curdling is from 16 to 18 hours. It is often convenient to set the milk to curdle overnight.

Pour the coagulum or curdled milk upon the drain cloth and allow it to drain from 2 to 4 hours, or until practically no whey drips from the cloth and the curd is comparatively dry.

Scrape the curd toward the center of the cloth and tie the diagonal corners of the cloth together to facilitate handling.

If ice is available place the bag or curd in crushed ice and leave it for 3 hours or longer. If ice is not available allow the curd to drain an extra hour or more.

Place the bag of curd between two clean boards, put a 50-pound weight upon it, and let it stand. Pressing should cease when there is a yield of about 4½ pounds of Neufchâtel or about 5½ pounds of

cream cheese. This will take about 6 or 8 hours. If a cider or other screw press is available the time required for pressing is about 1½ hours.

Remove the curd from the cloth into a pail, sprinkle two level tablespoonfuls of fine salt over the curd, and thoroughly mix with a potato masher until it has a smooth, buttery consistence. Running the cheese through a food chopper or working it with a butterworker produces the same result.

Place the cheese in a crock or enameled dish until ready for use.

Mold the cheese into commercial packages by means of the food chopper, special attachment, and cheese cutter.

Wrap in tin foil or aluminum foil, or pack in glass jars.

Keep the cheese at a temperature of 50° F. or below until consumed. At that temperature Neufchâtel and cream cheese should keep from 6 to 12 days, and pimiento-cream cheese should keep nearly a month.

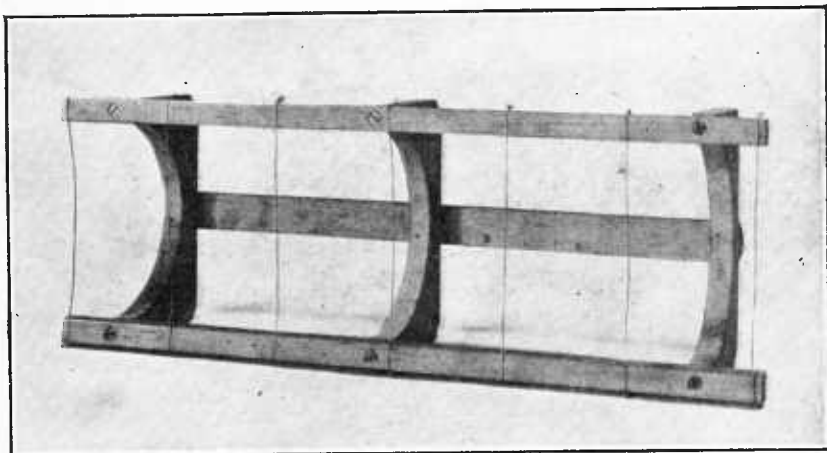


FIG. 12.—Cheese cutter

USE OF NEUFCHÂTEL AND CREAM CHEESE IN THE DIET²

From the dietary standpoint, Neufchâtel and cream cheeses are valuable for protein, fat, phosphorus, and calcium. Since the American diet is likely to run low in calcium, it is well to keep in mind that all cheeses are a good source of this much-needed mineral. There is every reason to believe that Neufchâtel and cream cheeses also contain the vitamins associated with milk fat, though to date no tests of the vitamin content of these particular kinds have been reported.

Neufchâtel and cream cheeses are suitable in any course of a meal. They may be part of the appetizer at the beginning of a dinner or of the dessert at the end, and in any course between. Because they are soft in texture, mild in flavor, and molded into an attractive

² Prepared by Bureau of Home Economics.

form, they can be served quickly and easily. A popular way is with toasted bread or crackers and jam, marmalade, or a sour relish, for contrast in flavor. Or they may be combined with fruits and vegetables in almost unlimited ways for salads and sandwiches. Hot dishes may also be made with these cheeses if the supply is particularly abundant. The sharper-flavored harder cheeses, however, are generally better for cookery. These soft cheeses are so convenient and appetizing when served simply that it is best to make the most of these points.

The following recipes and suggestions illustrate a few of the many ways of serving these soft cheeses:

CRACKERS AND CHEESE WITH RELISHES OR FRUIT PRESERVES

Serve Neufchâtel or cream cheese with crisp crackers, thin dry slices of oven-toasted bread, or biscuit and a tart vegetable relish or fruit preserves. For an hors' d'oeuvres, or appetizer at the beginning of the meal, a sour relish is generally preferred. If the cheese and crackers are for dessert, accompany them with sweet jam, marmalade, preserves, or jelly. Ginger pears, preserved ginger root, Bar le duc currants, orange marmalade, or apricot and pineapple

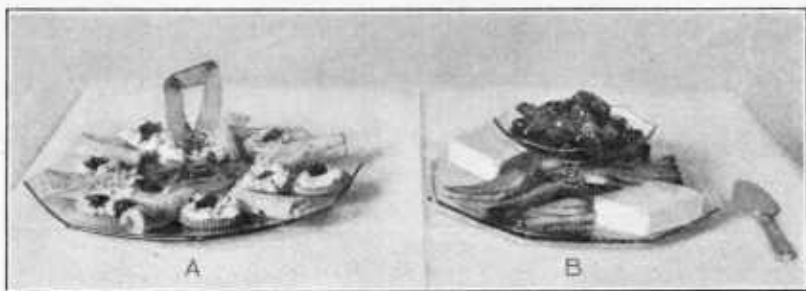


Fig. 13.

jam combine especially well with the cheese flavor. Arrange the crackers, cheese, and whatever goes with it attractively in a three-compartment or double-decker dish. (Fig. 13, B.) Or put the preserves, jelly, or relish in the center of a large plate, cut the cheese into pieces and arrange them around the preserves, and place the crackers around the outside. Another attractive way of serving this combination for afternoon tea is to spread the cheese on crisply toasted crackers, leaving a hollow in the cheese toward the center and dropping into it a bit of the preserved fruit or jelly. (Fig. 13, A.) These give a festive touch to the tea table and yet can be prepared very quickly. The cheese softens the crackers on standing, so do not combine them until a short time before serving.

Several of the combinations of cheese with chopped peppers, onions, and other highly flavored foods can be used on toasted crackers as appetizers at a meal or for afternoon tea.

SANDWICH OR SALAD MIXTURES

Many mixtures of Neufchâtel or cream cheese with vegetables or fruits and seasonings may be used as spreads for sandwiches or served in salads in balls or various other attractive forms. (Fig. 14, B.) Some of these mixtures also make excellent frozen salads. These are easily made by putting the mixture into a mold, packing in ice and salt, and allowing it to stand several hours. The frozen salad is then sliced, placed on crisp lettuce, and served at once.

CHEESE WITH OLIVES, PIMENTOS, OR GREEN PEPPERS, AND NUTS

Mix equal quantities of the soft cheese and chopped olives, pimentos, and nuts, or any one or two of these if all three are not desired. Add salt and a little onion juice if liked.

Spread on slices of white or graham bread. For salads this mixture may be formed into balls, or stuffed into fresh green peppers from which the centers have been removed, or into canned pimentos, and sliced. These may be served alone on lettuce with salad dressing, or used to garnish many other kinds of salads.

CHEESE AND PICKLE

Mix the cheese with finely chopped dill pickle, chow-chow, chili sauce, or any other desired pickle mixture. Use as sandwich filling or as a spread on crackers, or in salads.

CHEESE WITH CHOPPED PARSLEY, WATERCRESS, OR OTHER VEGETABLES

Into the soft cheese, work finely chopped parsley, watercress, lettuce, spring onions, chives, radishes, cucumber, celery, or any other salad vegetable. Add salt and any other seasoning desired, such as onion or lemon juice.

Use this mixture as a sandwich spread, or for salads pile it lightly on crisp lettuce or form it into balls as suggested under "Cheese with olives," etc. The balls may also be rolled in chopped parsley or watercress.

CHEESE AND CELERY

Clean celery thoroughly, wipe the stalks or allow the water to drain off, cut them into short lengths, and fill the hollows with any one of the cheese mixtures

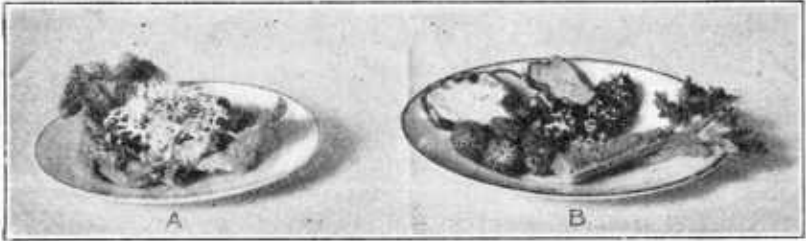


Fig. 14.

given under the two preceding headings. Serve this stuffed celery as an appetizer at the beginning of the meal, as a relish with the main course, or as a garnish with salad.

CHEESE AND TOMATOES

Use any one of the mixtures of cheese with olives, peppers, nuts, or chopped vegetables described above. Spread this on slices of tomato and use these in sandwiches or place them on lettuce and serve as salad. Or for salad, scoop out part of the inside of the tomatoes after they are peeled, stuff them with the cheese mixture, and arrange them on lettuce. Or make a little mound of the cheese mixture on lettuce and arrange around it a tomato peeled and cut like an apple into quarters.

PRUNES, DATES, OR FIGS STUFFED WITH CHEESE

Split cooked prunes, take out the seeds, and stuff the cavities with Neufchâtel or cream cheese plain or mixed with chopped nuts. Serve on lettuce with salad dressing. Stuff the dates in this same way after they have been split and the seeds removed. Canned figs or cooked dried figs may be split and used in this same way.

DRIED FRUIT AND CHEESE MIXTURES

Wash prunes, dates, raisins, or dried figs or apricots, and put them through the food chopper using the fine knife. Mix the ground fruit with about twice as much cheese. Add a little salt, and chopped nuts if desired. Roll this into balls and use as suggested in salads or on crackers for afternoon tea or as the filling for sandwiches.

CHEESE WITH CANNED PEACHES, PEARS, OR CHERRIES

Fill the hollows of canned peaches or pears with Neufchâtel or cream cheese, plain or mixed with nuts, dried fruits, or one of the chopped vegetables suggested, and serve on lettuce with salad dressing. Or make a little mound of the cheese on the lettuce and put slices of peaches or pears around it. Large white canned cherries with the pits removed or stewed dried apricots may be combined with the cheese in this same way.

CHEESE AND PINEAPPLE

Arrange slices of raw or canned pineapple on lettuce, and into the center of each slice drop a ball made of Neufchâtel or cream cheese mixed with chopped nuts or green pepper or pimento, and seasoned with salt. This is sometimes called Honolulu salad.

Or after the pineapple slices are arranged on the lettuce, cover them with the cheese pressed through a potato ricer, and sprinkle on a little salt and paprika. (Fig. 14, A.)

Finely chopped pineapple mixed with the cheese makes an excellent spread for sandwiches or for toasted bread or crackers for afternoon tea.

APPLE SURPRISE SALAD

Select tart apples of uniform size. Core, pare, and simmer them whole in sirup made in the proportion of 1 cup sugar to 2 cups boiling water. If desired, add a few red cinnamon drops to the sirup to flavor and color the apples. As soon as the apples are tender, remove them from the sirup carefully so that they will keep their shape. When they are cold, fill the cavities with Neufchâtel or cream cheese seasoned with salt and paprika or mixed with chopped nuts. Place the apples on lettuce and serve as salad with any desired dressing. Or serve them as dessert with some of the apple sirup around them.

CHEESE DRESSING FOR SALADS

1 Neufchâtel or cream cheese,
 ½ cup salad oil,
 3 to 4 tablespoons lemon juice,
 ½ teaspoon salt.

Tabasco sauce, onion juice, a bit of
 garlic, or grated horseradish, for
 seasoning.

Mash up the cheese, add the oil, and beat with a Dover egg beater until thoroughly mixed. Add the other ingredients and continue to beat until the mixture is smooth and creamy. Use this dressing in the same way as mayonnaise or any other salad dressing. For fruit salads it is particularly delicious if whipped cream is added.

CHEESE AND JAM OR JELLY SANDWICHES

Spread slices of bread rather thickly with Neufchâtel or cream cheese and on one of them put a layer of jam or jelly. Press the slices of bread together. These sandwiches are also excellent toasted.

MISCELLANEOUS CHEESE DISHES

CREAM OR NEUFCHÂTEL CHEESE TOASTED

1½ cheeses,
 1 egg,
 ¼ teaspoon salt.

¼ teaspoon baking powder.
 Tabasco or Worcestershire sauce.

Cream the cheese and add the beaten egg yolk, the salt, and enough Tabasco, Worcestershire, or any other highly seasoned sauce to give flavor. Mix well, fold this into the beaten white of egg. When thoroughly blended add the baking powder. Toast thin slices of bread on one side. Cover the untoasted side with the cheese mixture. Slices of mild-flavored onions may be laid on the bread before the cheese mixture is added, if desired. Brown the cheese slightly under slow heat and serve at once. This is an excellent luncheon or supper dish when served with bacon or may be used on small rounds of toast or on crackers for afternoon tea. (Fig. 15, B.)

CHEESE FILLING FOR GINGERBREAD

- 2 Neufchâtel or cream cheeses. $\frac{1}{2}$ teaspoon salt.
 2 cups chopped dates. Cream.
 1 cup chopped nuts.

Mash the cheese and mix with it enough cream to give it the consistency of a soft filling. Add the dates, nuts, and salt, and mix well. Split open a thin loaf of hot gingerbread, spread the cheese mixture on the lower half, replace the upper part and press it down lightly. The quantity of cheese filling given here is enough for a loaf of gingerbread about 8 by 10 inches. Serve the gingerbread at once while still hot. (Fig. 15, A.)

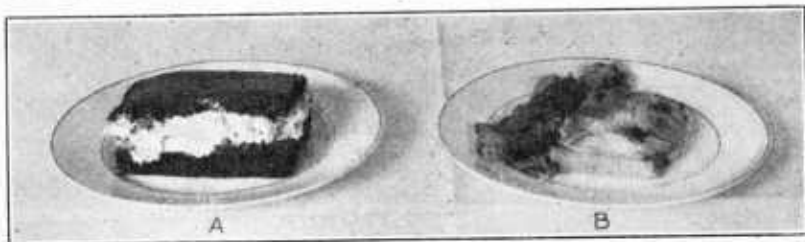


Fig. 15.

FROZEN CHEESE WITH FRUIT

- 2 Neufchâtel or cream cheeses. $\frac{1}{2}$ teaspoon vanilla.
 1 cup double cream. $\frac{1}{2}$ cup chopped canned pineapple,
 $\frac{1}{4}$ cup milk. preserved cherries, dates, figs, or
 $1\frac{1}{4}$ cups powdered sugar. raisins.
 $\frac{1}{4}$ teaspoon salt.

Break up the cheeses and mix the milk with them. Add the sugar, salt, and chopped fruit and vanilla and mix thoroughly. Whip the cream until it is stiff and fold in the cheese mixture. Pour into a mold, pack in crushed ice and salt, and let stand for three or four hours to freeze. Pound baking powder tins lined with tough white paper make suitable molds. Serve the frozen cheese in slices with or without a garnish of the chopped fruit. Or if preferred, leave the chopped fruit out of the mixture and serve it as a garnish on top. A whole preserved fig on a round of the frozen cheese is a particularly attractive combination.

This same mixture unfrozen is also an excellent filling for charlotte russe made with lady fingers or sponge cake.

**ORGANIZATION OF THE
UNITED STATES DEPARTMENT OF AGRICULTURE**

July 1, 1930

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